

Method and apparatus for stripping electrolytic precipitate from supporting structures

Patent Number: ☐ US4806213
Publication date: 1989-02-21
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Requested Patent: AU600029
Application
Number: US19870104344 19871117
Priority Number
(s): FI19860004000 19861003
IPC Classification:
EC Classification: C25C7/08
Equivalents: AU7885887, BE1000538, CA1317562, ☐ DE3733683, ☐ FI76382B, ☐ FI76382C,
FI864000, ☐ IT1222814

Abstract

The invention relates to a method and apparatus for stripping a thin, sheet-like layer of electrolytically accumulated metal precipitate (6) from its supporting structures (1) by means of a peeling blade (4) driven towards the upper edge of the precipitate layer (6). For the stripping operation, the supporting structure (1) is first attached to the stripping station by aid of gripping members (2, 3), the frame whereof advantageously provides a housing in common with the peeling blades (4). Moreover, the measuring and control members (7, 8) which are advantageously located in the common housing, are used in determining the surface profile of the supporting structure (1), and the obtained profile is made use of while choosing the orientation of the peeling blade (4).

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(12) PATENT ABSTRACT (11) Document No. AU-A-78858/87
(19) AUSTRALIAN PATENT OFFICE

(51)4 INTERNATIONAL PATENT CLASSIFICATION

C25C 007/08

(21) Application No. : 78858/87 (22) Application Date : 22.09.87

(30) Priority Data

(31) Number (32) Date (33) Country
864000 03.10.86 FI FINLAND

(43) Publication Date : 14.4.88

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(54) Title
STRIPPING ELECTROLYTIC PRECIPITATE

(57) Claim

1. A method for stripping a thin, sheet-like layer of electrolytically accumulated metal precipitate (6) from its supporting structure (1) by means of a motion of a peeling blade (4) driven towards the upper edge of the precipitate layer (6), c h a r a c t e r i z e d in that in order to carry out the stripping, the supporting structure (1) is attached to the stripping station by aid of gripping members (2, 3), and that measuring and control members (7, 8) are employed for measuring the surface profile of the supporting structure (1), and that the obtained profile is made use of while choosing the orientation of the peeling blade (4).

7. An apparatus for realizing the method of claim 1, c h a r a c t e r i z e d in that the frame of the gripping members (2, 3) simultaneously provides a housing for the peeling blades (4).

AUSTRALIA
PATENTS ACT 1952
COMPLETE SPECIFICATION

Form 10 -

(ORIGINAL)

FOR OFFICE USE

Short Title:

Int. Cl:

Application Number:
Lodged:

Complete Specification-Lodged:
Accepted:
Lapsed:
Published:

Priority:

Related Art:

TO BE COMPLETED BY APPLICANT

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Complete Specification for the invention entitled:
METHOD AND APPARATUS FOR STRIPPING ELECTROLYTIC
PRECIPITATE FROM SUPPORTING STRUCTURES

The following statement is a full description of this invention
including the best method of performing it known to me:-

METHOD AND APPARATUS FOR STRIPPING ELECTROLYTIC PRECIPITATE FROM SUPPORTING STRUCTURES

The present invention relates to a method and apparatus for stripping thin, sheet-like layers of electrolytically accumulated metal precipitate from supporting structures such as a cathode sheet or a mother sheet by employing a peeling blade which is advantageously driven towards the upper edge of the precipitate.

In the electrolytic production of metal, such as zinc, it is customary to use an aluminium cathode sheet, on the surface whereof the metal layer is precipitated. The metal layer is stripped after the layer has reached sufficient thickness. In the stripping procedure there is commonly used a stripping machine comprising a peeling unit. The peeling unit wedges an aperture at the upper edge of the metal layer, whereafter the layer can be stripped in the stripping unit proper.

In the method introduced in the US Patent 3 689 396, the knife-like blades are driven under the metallic precipitate at the side edge by employing a hinged plastic guard, which prevents the metal precipitate from accumulating in the corner of the cathode sheet. In order to strip the metal layer, the guard member is opened, and the blades have access to under the precipitate layer through the aperture formed under the guard member. However, the cathode sheets are easily corroded under the guard members, which considerably shortens the working age of the cathode sheets. Hence the cathode sheets and their production bring about remarkable expenses.

The object of the present invention is to obviate some of the drawbacks of the prior art and to achieve an improved and cheaper method and apparatus for stripping metal precipitates from their supporting structures, and the essential novel features of the invention are enlisted in the appended patent claims.

In order to perform an advantageous stripping according to the invention, the cathode sheet comprising the metal precipitate is firmly attached at the top edge by means of gripping members which form the frame guiding the peeling blades. The position of the gripping members with respect to the cathode sheet is advantageously chosen so that the jaws lock the cathode sheet on both sides of the corroded zone caused by the solution boundary of the electrolysis, so that the torques created in connection with the stripping do not turn or bend the cathode sheet. Moreover, the gripping members are employed for measuring, by aid of intermediate members, the depth of the corrosion in order to define the profile of the cathode sheet. On the basis of the obtained profile, the movement of the peeling blades is guided in conformity to the shape of the corrosion, so that the peeling blades move advantageously along the surface of the cathode sheet both in height and in depth, thus preventing any cutting of the cathode sheet which would lead to further damage.

The peeling blades of the apparatus of the invention are advantageously knife-like blades which are stuck in between the metal precipitate and the cathode sheet on both sides of the sheet. The peeling blades wedge an advantageous aperture in between the metal precipitate and the cathode sheet, which is made use of in stripping the metal precipitate.

According to the invention, the metal precipitate is stripped off the cathode sheet with a minimum wearing of the cathode, whereby the working age of the cathode sheet is lengthened and the expenses caused by the sheets are essentially reduced. Moreover, work safety can be essentially improved, because now hazardous situations caused by damaged sheets arise more rarely than before, the probability of damaged sheets thus being minimized.

The invention is described in more detail with reference to the appended drawings, wherein Figure 1 is a side-view illustration of a preferred embodiment

of the invention;

Figure 2 is a side-view illustration of the peeling blade of the embodiment of figure 1; and

Figure 3 is a front-view illustration of the peeling blade of the embodiment of figure 1.

For an advantageous realization of the method of the invention, the cathode sheet 1 lifted from the electrolytic bath is washed and conveyed to the stripping station according to figure 1. In the stripping station the cathode sheet 1 is fastened on both sides of the upper edge by means of two part gripping members 2 and 3. The gripping members 2 and 3 are interconnected by aid of the frame 5, which at the same time serves as the housing for the peeling blades employed in the stripping procedure.

Before the stripping procedure proper, there is determined the profile of the cathode sheet 1, possibly deviating from a straight planar surface and formed of earlier removed metal precipitate layers and/or caused by the solution boundary of the electrolysis. The determination of the profile is carried out by means of the measuring members 7 and control members 8, attached to the frame above the precipitate layer 6 formed on the cathode sheet 1. On the basis of the measured surface profile of the cathode sheet, the position of the peeling blades 4 with respect to the frame 5 for starting the stripping is chosen so that any wearing of the cathode sheet 1 owing to the stripping of the precipitate layer 6 can be essentially avoided.

The peeling blades 4 employed in the stripping are, as is apparent from figures 2 and 3, knife-like in shape and have an advantageously bluntish and narrow point. The stripping motion of the peeling blades 4 is advantageously started vertically near the upper edge of the precipitate layer 6a, and the blades are driven, controlled by the control members 8, along the determined surface profile of the cathode sheet 1 so that the points of the peeling blades 4 are kept essentially near to the sheet surface also in the corroded zone of the sheet 1.

Thus the peeling blades are essentially simultaneously driven both vertically and in depth in order to achieve an advantageous realization of the invention.

THE CLAIMS DEFINING THE INVENTION ARE AS FOLLOWS:

1. A method for stripping a thin, sheet-like layer of electrolytically accumulated metal precipitate (6) from its supporting structure (1) by means of a motion of a peeling blade (4) driven towards the upper edge of the precipitate layer (6), characterized in that in order to carry out the stripping, the supporting structure (1) is attached to the stripping station by aid of gripping members (2, 3), and that measuring and control members (7, 8) are employed for measuring the surface profile of the supporting structure (1), and that the obtained profile is made use of while choosing the orientation of the peeling blade (4).
2. The method of claim 1, characterized in that the gripping members (2, 3) are attached to the supporting structure (1) essentially near to the upper edge of the precipitate layer (6).
3. The method of claim 1 or 2, characterized in that the surface profile of the supporting structure (1) is determined by aid of the gripping station of the gripping members (2, 3).
4. The method of claim 1, 2 or 3, characterized in that the stripping motion of the peeling blades (4) is started essentially near to the upper edge of the precipitate layer (6) and essentially vertically.
5. The method of any of the preceding claims, characterized in that the peeling blades (4) are during the stripping operation driven essentially near to the surface of the supporting structure (1).
6. The method of claim 5, characterized in that the peeling blades (4) are driven both vertically and in depth with respect to the supporting structure (1).

7. An apparatus for realizing the method of claim 1, characterized in that the frame of the gripping members (2, 3) simultaneously provides a housing for the peeling blades (4).

8. The apparatus of claim 7, characterized in that the frame (5) comprises the control members (8) of the peeling blades (4).

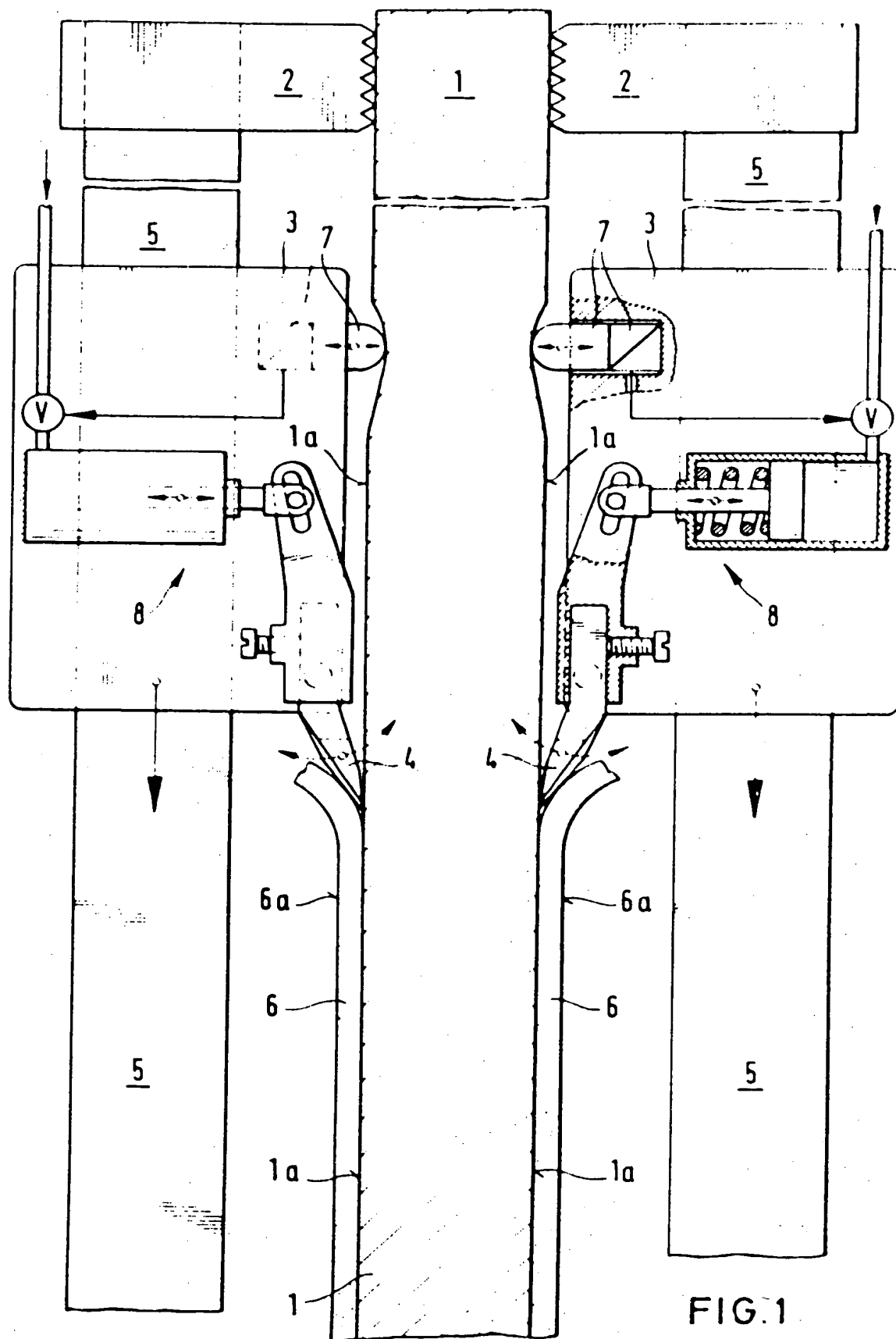
DATED THIS 22ND DAY OF SEPTEMBER 1987

OUTOKUMPU OY

By its Patent Attorneys:

CLEMENT HACK & CO.

Fellows Institute of Patent
Attorneys of Australia.



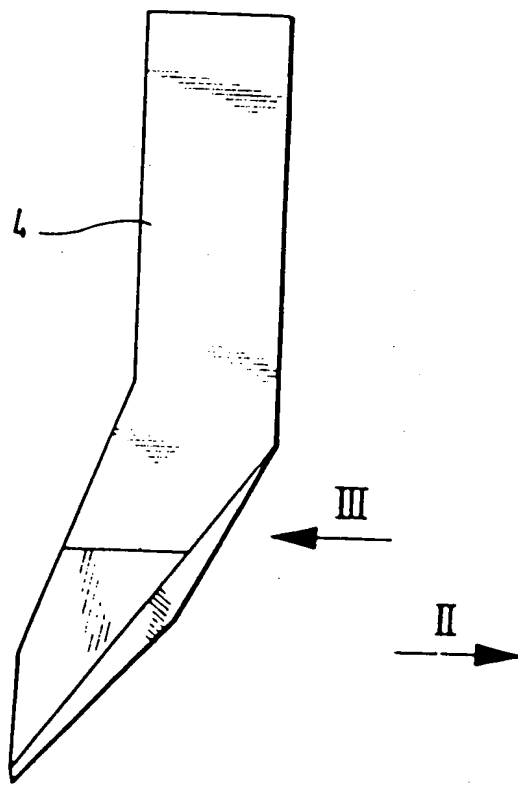


FIG. 2

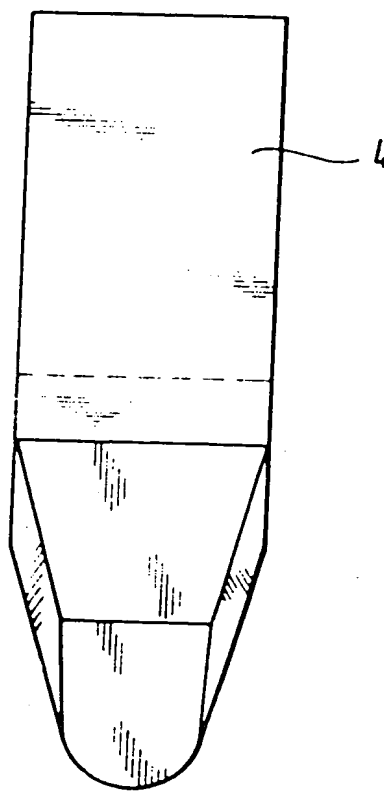


FIG. 3